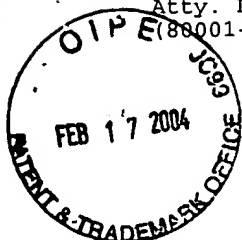


#17



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the U. S. Patent Application of

Hiroki ENDO et al.

Application No.: 09/272,331

Filed: March 19, 1999

Group: 2612

Examiner: R. Tillery

Confirmation No.: 5505

For: METHOD OF PRODUCING COLOR FILTER FOR SOLID-STATE IMAGING
DEVICE

REPLY BRIEF

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Sir:

This is a Reply Brief under Rule 193 in response to the Examiner's Answer mailed on December 16, 2003 (Paper No. 15).

It is noted that "[t]he primary examiner must then either: (A) acknowledge receipt and entry of the reply brief by using form paragraph 12.47 on form PTOL-90; or (B) reopen prosecution to respond to the reply brief." M.P.E.P §1208.03.

Rejection under 35 U.S.C. §102

Claims 1-2, 4, 6-7 and 9-16

Within the Final Office Action, claims 1-2, 4, 6-7 and 9-16 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,876,167 to Snow et al. Accordingly, the

claims have been grouped within the Appeal Brief of October 6, 2003 as follows:

Claims 1-2 and 4 stand or fall together with respect to the §102(b) rejection as being anticipated by U.S. Patent No. 4,876,167 to Snow et al. (Snow).

Claims 6, 7 and 9-11 stand or fall together with respect to the §102(b) rejection as being anticipated by Snow.

Claims 12-16 stand or fall together with respect to the §102(b) rejection as being anticipated by Snow.

Claim 1 and the claims dependent thereon recite a method of producing a color filter, comprising the steps of: forming a filter layer of a second color in a substrate region in which a filter element of a first color is to be formed; and overlapping a filter layer of a third color different from said second color on said filter layer of said second color and on said substrate; wherein two overlapping filter layers form the filter element, and wherein said filter layer of a third color is made from a dye containing photoresist.

Claim 6 and the claims dependent thereon recite a color filter comprising: a filter element of a first color, said first color filter element having a filter layer of a second color overlapping a portion of a filter layer of a third color, wherein said first, second and third colors are different from each other, and wherein the second color layer is both in the same row as the third color layer and the second color layer is in a row above the third color layer, and wherein said filter layer of a third color is made from a dye containing photoresist.

Claim 12 and the claims dependent thereon recite a solid-state imaging device comprising: a plurality of light receiving sensor portions for photo-electric conversion, provided in a surface layer portion of a substrate; and a color filter provided correspondingly to said plurality of light receiving sensor portions; wherein said color filter has a filter element of a first color having a filter layer of a second color overlapping a portion of a filter layer of a third color, and wherein said filter layer of a third color is made from a dye containing photoresist.

Within the claims, the filter layer of a third color is made from a dye containing photoresist.

However, the color filter arrays of Snow are comprised of interlaid sets of laterally displaced filters comprised of at least one mordanted anionic dye and a polymeric matrix which provides cationic mordanting sites (Snow at column 5, lines 4-8). Snow further teaches that by providing a polymeric mordant which is directly crosslinked and thereby patterned by near UV and visible light the necessity of blending with it a photoresist polymer to form a filter element is eliminated (Snow at column 3, line 66 to column 4, line 2).

Thus, Snow fails to disclose, teach or suggest a filter layer of a third color made from a dye containing photoresist.

However, the Examiner's Answer indicates that the rejection of claims 1-2, 4, 6-7 and 9-16 under 35 U.S.C. §102(b) as being allegedly anticipated by U.S. Patent No. 4,876,167 to Snow et al. (Snow) made within the Final Office Action of May 5, 2003 has

been replaced with a rejection of claims 1-4 and 6-17 under 35 U.S.C. §103(a) as being allegedly unpatentable over U.S. Patent No. 4,876,167 to Snow in view of U.S. Patent No. 5,140,396 to Needham et al. (Needham).

Thus, the rejection of claims 1-2, 4, 6-7 and 9-16 under 35 U.S.C. §102(b) as being allegedly anticipated by Snow made within the Final Office Action of May 5, 2003 is deemed to have been overcome by the Amendment After Final Action under 37 C.F.R. §1.116 filed on August 5, 2003, and withdrawn.

Rejection under 35 U.S.C. §103

Claims 3, 8 and 17

Within the Final Office Action, claims 3, 8 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al. Accordingly, the claims have been grouped within the Appeal Brief of October 6, 2003 as follows:

Claims 3, 8 and 17 stand or fall separately with respect to the §103(a) rejection as being unpatentable over Snow et al. in view of U.S. Patent No. 5,140,396 to Needham et al. (Needham).

Claim 3 is dependent upon claim 1. Claim 3 as read in light of claim 1 provides that each of the filter layers of the second and third colors is made from a dye containing positive photoresist.

Claim 8 is dependent upon claim 6. Claim 8 as read in light of claim 6 provides that each of the filter layers of the second

and third colors is made from a dye containing positive photoresist.

Claim 17 is dependent upon claim 12. Claim 12 as read in light of claim 12 provides that each of the filter layers of the second and third colors is made from a dye containing positive photoresist.

The color filter arrays of Snow are comprised of interlaid sets of laterally displaced filters comprised of at least one mordanted anionic dye and a polymeric matrix which provides cationic mordanting sites (Snow at column 5, lines 4-8). Snow further teaches that by providing a polymeric mordant which is directly crosslinked and thereby patterned by near UV and visible light the necessity of blending with it a photoresist polymer to form a filter element is eliminated (Snow at column 3, line 66 to column 4, line 2).

Thus, Snow fails to disclose, teach or suggest each of the filter layers of the second and third colors being made from a dye containing positive photoresist.

Needham arguably teaches a structure having a photoresist layer 16 (Needham at column 9, line 34 and figures 1A and 2C). However, within figure 2D of Needham, photoresist 16C is removed to expose layer 14C (Needham at column 10, lines 38-43). Specifically, a second reactive ion etching (or combination of ion etching steps) then removes the remaining regions of the photoresist material and the bared regions of the absorber layer, thereby forming a filter on the substrate (Needham at column 5, lines 34-38).

Needham fails to disclose, teach or suggest layer 16C as a filter layer of a third color made from a dye containing photoresist. Thus, figure 1A through figure 3 of Needham fail to disclose, teach or suggest each of the filter layers of the second and third colors being made from a dye containing positive photoresist.

Moreover, Needham arguably teaches layer 14C as a barrier material (Needham at column 10, line 43), wherein the barrier material is silicon-based (Needham at column 7, lines 14-15) and is not a photoresist.

Needham also fails to disclose, teach or suggest layer 14C as a filter layer of a third color made from a dye containing photoresist. Thus, figure 1A through figure 3 of Needham fail to disclose, teach or suggest each of the filter layers of the second and third colors being made from a dye containing positive photoresist.

Needham arguably teaches an absorber layer 12 made of an absorber material (Needham at column 9, lines 29-32). The absorber material comprises a polymer having a dye material therein (Needham at column 6, lines 10-11). The polymer may be any film-forming polymer having the appropriate reactive ion etch characteristics, for example a polyester, a polyamide or a Novolak resin (Needham at column 6, lines 21-24).

But Needham fail to disclose, teach or suggest layer 12 as a filter layer of a third color made from a dye containing photoresist. Thus, figure 1A through figure 3 of Needham fail to disclose, teach or suggest each of the filter layers of the

second and third colors being made from a dye containing positive photoresist.

Figures 4A-4B of Needham arguably teach a composition comprising a cyan dye in a positive photoresist that is applied over the whole surface of the solid state imager 10 to produce a photoresist/dye layer 22, wherein the photoresist/dye layer 22 is exposed and developed to produce cyan filter elements 22C (Needham at column 9, lines 60-66).

But figures 4A-4B of Needham fail Needham fail to disclose, teach or suggest layer 12 as a filter layer of a third color made from a dye containing photoresist. Instead, Needham arguably teaches an absorber layer 12Y made of a yellow absorber material (Needham at column 10, line 57). The absorber material comprises a polymer having a dye material therein (Needham at column 6, lines 10-11). The polymer may be any film-forming polymer having the appropriate reactive ion etch characteristics, for example a polyester, a polyamide or a Novolak resin (Needham at column 6, lines 21-24).

Thus, figures 4A-4B of Needham fail to disclose, teach or suggest each of the filter layers of the second and third colors being made from a dye containing positive photoresist.

Claim 5

Within the Final Office Action, claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,876,167 to Snow et al. in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503A2 to Ugai et al. (Ugai).

Accordingly, the claims have been grouped within the Appeal Brief of October 6, 2003 as follows:

Claim 5 stands or falls alone with respect to the §103(a) rejection as being unpatentable over Snow in view of U.S. Patent No. 5,805,966 to Yamada in further view of EP 726503 A2 to Ugai et al.

The color filter arrays of Snow are comprised of interlaid sets of laterally displaced filters comprised of at least one mordanted anionic dye and a polymeric matrix which provides cationic mordanting sites (Snow at column 5, lines 4-8). Snow further teaches that by providing a polymeric mordant which is directly crosslinked and thereby patterned by near UV and visible light the necessity of blending with it a photoresist polymer to form a filter element is eliminated (Snow at column 3, line 66 to column 4, line 2).

Thus, Snow fails to disclose, teach or suggest a filter layer of a third color made from a dye containing photoresist.

In addition, claim 5 is dependent upon claims 1 and 4. Within claim 5, a principal pigment contained in a material for forming said yellow filter layer is an azo pigment; a principal pigment contained in a material for forming said cyan filter layer is a copper phthalocyanine pigment; and a principal pigment contained in a material for forming said magenta filter layer is a xanthene pigment.

However, Snow fails to disclose, teach or suggest a magenta filter layer having a xanthene pigment. The Final Office Action,

then, cites Yamada and Ugai for the features deficient within Snow.

While Yamada arguably teaches a developer layer forming device having a blade pressed against a developing roller at an edge portion, and Ugai arguably teaches an image-forming method and image-forming apparatus, there is no motivation to lead the skilled artisan to combine the inventions of Yamada and Ugai with that of Snow.

In particular, Snow arguably teaches a color filter array. But Ugai discloses toners for image transfers and Yamada discloses a developer layer. The teachings found within Yamada and Ugai, nevertheless, fail to disclose, teach or suggest why one of ordinary skill in the art would have modified Snow using Yamada or Ugai.

It has been held that the motivation to set forth an obviousness-type rejection of the claims "must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from [the] disclosure." *Ex parte Nesbit*, 25 USPQ2d, 1817, 1819 (Bd. Pat. App. & Int. 1992).

"Hindsight is not proper criteria for resolving the issue of obviousness." *In re Horn et al.*, 203 USPQ 969, 971 (CCPA 1979). Instead, "it is facts which must support the legal conclusion of obviousness under 35 U.S.C. §103. Such facts must flow from the prior art either by way of specific reference or by generally known facts of which official notice may be taken." *Ex parte Crissy et al.*, 201 USPQ 689, 695 (Bd. Pat. App. & Int. 1976). The specific reference or generally known facts must have existed

"at the time the invention was made." *In re Merck & Co.*, 231 USPQ 375, 379 (Fed. Cir. 1986).

In this regard, however, the Final Office Action fails to provide a suitable teaching, suggestion or inference in the prior art which demonstrates that the concept and advantages as claimed would have been well known to one of ordinary skill in the art at the time the claimed invention was made.

Conclusion

The prior art of record, either individually or as a whole, fails to disclose, teach or suggest all the features of the claimed invention. For at least the reasons set forth hereinabove, the rejection of the claimed invention should not be sustained.

Therefore, a reversal of the Final Rejection of December 16, 2003 is respectfully requested.

Respectfully submitted,

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